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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/437,607	11/10/1999	RUFUS L. CHANEY	1797.0090005	8216

4372 7590 01/24/2002

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WASHINGTON, DC 20036

EXAMINER

IBRAHIM, MEDINA AHMED

ART UNIT	PAPER NUMBER
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1638

DATE MAILED: 01/24/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/437,607

Applicant(s)

CHANEY ET AL.

Examiner

Medina Ibrahim

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 November 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) 5-7, 19-37 and 41-47 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-18 and 38-40 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 14.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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### **DETAILED ACTION**

The text of these sections of the Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-47 are pending in this application.

Claims 1-4, 8-18, 38-40 are under examination.

Claims 5-7, 19-37, and 41-47 remain withdrawn from consideration as being drawn to a non-elected invention.

Applicants' response and the IDS of Paper #14 filed on 11/13/01 have been considered.

#### ***Withdrawn rejections***

The rejection under 35 U.S.C. 112, 2nd paragraph to claims 1-4, 8-18, and 38-40 have been withdrawn in view of Applicant's amendment to the claims and in view of further consideration by the Examiner.

#### ***Claim Rejections - 35 USC 112***

Claims 1-4 and 38-40 remain rejected under 35 U.S.C. 112, first paragraph, because the specification while being enabling for the use of the hyperaccumulators of Alyssum species that accumulate heavy metals from metal-contained soil, does not provide enablement for other hyperaccumulator plants or methods for their use to accumulate heavy metals from soils. This rejection is repeated for the same reasons as set forth in pages 3-4 of the office action mailed on 07/18/01. Applicants' arguments filed on 11/16/01 have been fully considered but they are not persuasive.

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Contrary to Applicant's arguments in pages 4-5 of the response, claims broadly drawn to methods that use any "one metal hyperaccumulator plant" are not supported by an enabling disclosure taking into account the *In re Wands* factors cited in page 5 of the response. While both the specification and the prior art discloses removal of metals from metal- rich soils by growing plants of the Brassicaceae family, no mention is made for non-Brassica hyperaccumulators and no specific soil conditions have been disclosed for non-Alyssum hyperaccumulators. The specification only provides guidance for the use of Alyssum hyperaccumulator plants and specific soil conditions that permits accumulation of heavy metals from serpentine soils. The specification does not provide guidance for non-Alyssum hyperaccumulators and the specific soil conditions that permits non-Alyssum plants to hyperaccumulate heavy metals from soils. Neither the instant specification nor Applicants response provides any evidence that the specific soil conditions disclosed for the Alyssum metal- hyperaccumulators would also permit non-Alyssum plants to hyperaccumulate metals from different types of metal- contaminated soils, especially where the plant can accumulate at least 2, 3, or 4 times more concentration of heavy metals than it is in the soil. And given the complexity and the nature of different types of soils, it is unpredictable whether the method provided in the specification for removing heavy metals by "elevating soil pH" for Alyssum hyperaccumulators is applicable for other unidentified hyperaccumulators. Therefore, it is an undue experimentation for one skilled in the art to identify and characterize other heavy metal-hyperaccumulator plants, and develop optimum methods and optimum soil

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conditions that would permit accumulation of heavy metals, especially the concentration of heavy metals of claims 16-18 and 38-40, absent further guidance.

The rejection is maintained.

***Double Patenting***

The double patenting rejection to claims 1-4, 8-18 and 38-40 as being unpatentable under claims 1-5 of US PAT# 5, 711, 784 is maintained for the reasons of record. Applicants' intent to file a Terminal Disclaimer is acknowledged. However, the intent to file terminal disclaimer does not overcome the rejection.

***Claim Rejections - 35 USC § 103***

Claims 1-4, 8, 10, 12-13, 16-18, and 38-40 remains rejected under 35 U.S.C. 103(a) as being unpatentable over Raskin et al ( US 5, 785, 735, filed June 1994). This rejection is repeated for the same reasons as set forth in page 7 of the office action mailed on 07/18/01. Applicants' arguments filed on 11/16/01 have been fully considered but they are not persuasive.

Applicants' argument that Raskin et al teach **decreasing** the soil pH to remove heavy metals from soil, while Applicant's invention requires elevated soil pH is not persuasive. Firstly, Raskin reference does not need to teach every claim limitation as the rejection is under 103 and not under 102. Rather, the Raskin reference must be read for what it teaches and fairly suggests to one of ordinary skill in the art. Secondly, Raskin et al is relied upon for its teaching of the method of removing heavy metals from soils using Brassicaceae hyperaccumulators. Raskin suggests that pH may be elevated for optimal growth (col. 7, line 58-62) and lowered for

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increased metal mobility (col. 8, throughout). Thirdly, Raskin et al suggests optimum soil pH for Brassicaceae hyperaccumulators, and therefore, decreasing or elevating soil pH depends upon the initial soil pH and upon the specific heavy metal to be removed. Brassicaceae hyperaccumulators require a soil pH range of 5.8-6.2 for optimal production (col. 7, lines 58-60). Raskin teaches balancing between higher pH for optimal Brassicaceae growth and lower pH for increased metal availability (col. 8, lines 25-33). Therefore, Raskin suggests that given a particular initial soil pH, a step of elevating the pH was known for increasing Brassicaceae growth while balancing the pH, especially towards harvest for increased metal mobility. Therefore, Applicant's assertion that Raskin et al's teaching is contrary to the claimed invention is incorrect. Therefore, one of ordinary skill in the art would have been motivated to use the method of removing heavy metal using the metal hyperaccumulator plant of Brassicaceae, with a reasonable expectation of success.

Claims 1-4, 8-18 and 38-40 remains rejected under 35 U.S.C. 103(a) as being unpatentable over Raskin et al ( US 5, 785, 735, filed June 1994) and further in view of Brooks et al (1981). This rejection is repeated for the same reasons as set forth in pages 7-8 of the office action mailed on 07/18/01. Applicants' arguments filed on 11/16/01 have been fully considered but they are not persuasive.

Applicants' argument that Raskin et al teach **decreasing** the soil pH to remove heavy metals from soil, while Applicant's invention requires elevated soil pH is not persuasive for the reasons discussed above. Brooks et al combined with Raskin renders the claimed invention obvious as Brooks discloses the use of the specifically claimed Alyssum species for the removal

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heavy metals from soil, as discussed in the last Office action. Absent evidence to the contrary, the rejection is maintained.

***Remarks***

No claim is allowed.

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Papers relating to this application may be submitted to Technology Sector 1 by facsimile transmission. Papers should be faxed to Crystal Mall 1, Art Unit 1638, using fax number (703) 308-4242. All Technology Sector 1 fax machines are available to receive transmissions 24 hrs/day, 7 days/wk. Please note that the faxing of such papers must conform with the Notice published in the Official Gazette, 1096 OG 30, (November 15, 1989).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Medina A. Ibrahim whose telephone number is (703) 306-5822. The Examiner can normally be reached Monday -Tuesday from 8:00 AM to 5:00 PM and Wednesday-Thursday from 9:00AM to 3:00PM

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If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Amy Nelson, can be reached at (703) 308-4310.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0196.

January 14, 2002

mai

1/22/02  
*Phuong T. Bui*  
PHUONG T. BUI  
PRIMARY EXAMINER